

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
15 July 2004 (15.07.2004)

PCT

(10) International Publication Number
WO 2004/058978 A3

(51) International Patent Classification⁷: C12N 15/70,
15/62, 9/52, A61K 39/00

(21) International Application Number:
PCT/GB2003/005647

(22) International Filing Date:
29 December 2003 (29.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0230247.9 28 December 2002 (28.12.2002) GB
PCT/GB02/005941
30 December 2002 (30.12.2002) GB
0317218.6 23 July 2003 (23.07.2003) GB

(71) Applicant (for all designated States except US): FUSION
ANTIBODIES LIMITED [GB/GB]; PO Box 374, Belfast
BT1 2WD (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): SCOTT, Christopher
[GB/GB]; 18 Carnbrae Avenue, Belfast BT8 6NH (GB).

(74) Agent: MURGITROYD & COMPANY; Scotland
House, 165-169 Scotland Street, Glasgow G5 8PL (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR,
CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,
SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
10 September 2004

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: PROTEIN PURIFICATION MEANS

(57) Abstract: Described is a novel purification tag, SNUT, based on the gene product of a sortase gene, in particular the *srtA* gene of *Staphylococcus aureus* and uses thereof. Also provided are expression constructs comprising DNA encoding the tag for the production of recombinant polypeptides. The tag can be used in methods of purifying soluble domains of a number of proteins previously not able to be isolated efficiently and methods of inducing and/or enhancing an immune response to an antigen of interest.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/05647

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/70 C12N15/62 C12N9/52 A61K39/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, EMBASE, MEDLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BIERNE H ET AL: "INACTIVATION OF THE SRTA GENE IN LISTERIA MONOCYTOGENES INHIBITS ANCHORING OF SURFACE PROTEINS AND AFFECTS VIRULENCE" MOLECULAR MICROBIOLOGY, BLACKWELL SCIENTIFIC, OXFORD, GB, vol. 43, no. 4, 2002, pages 869-881, XP001156904 ISSN: 0950-382X page 878, right-hand column, paragraph 3	2
X	WO 00/62804 A (UNIV CALIFORNIA) 26 October 2000 (2000-10-26) page 40, line 11 - line 23 --- -/-	2-5

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the International filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the International search

8 June 2004

Date of mailing of the International search report

06/07/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Loubradou, G

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/05647

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>TON-THAT HUNG ET AL: "Purification and characterization of sortase, the transpeptidase that cleaves surface proteins of Staphylococcus aureus at the LPXTG motif."</p> <p>PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES, vol. 96, no. 22, 26 October 1999 (1999-10-26), pages 12424-12429, XP002253866</p> <p>Oct. 26, 1999</p> <p>ISSN: 0027-8424</p> <p>the whole document</p> <p>---</p>	6-9, 15-18
X	<p>ILANGOVAN UDAYAR ET AL: "Structure of sortase, the transpeptidase that anchors proteins to the cell-wall of Staphylococcus aureus."</p> <p>PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES, vol. 98, no. 11, 22 May 2001 (2001-05-22), pages 6056-6061, XP002253867</p> <p>May 22, 2001</p> <p>ISSN: 0027-8424</p> <p>the whole document</p> <p>---</p>	6-9, 15-18
P,X	<p>WO 03/059945 A (FUSION ANTIBODIES LTD ; SCOTT CHRISTOPHER (GB); BUICK RICHARD (GB);) 24 July 2003 (2003-07-24)</p> <p>the whole document</p> <p>---</p>	1-18
A	<p>DAVIS GREGORY D ET AL: "New fusion protein systems designed to give soluble expression in Escherichia coli"</p> <p>BIOTECHNOLOGY AND BIOENGINEERING. INCLUDING: SYMPOSIUM BIOTECHNOLOGY IN ENERGY PRODUCTION AND CONSERVATION, JOHN WILEY & SONS. NEW YORK, US, vol. 65, no. 4, 1999, pages 382-388, XP002192026</p> <p>ISSN: 0006-3592</p> <p>the whole document</p> <p>---</p>	
A	<p>ZHANG Y ET AL: "EXPRESSION OF EUKARYOTIC PROTEINS IN SOLUBLE FORM IN ESCHERICHIA COLI"</p> <p>PROTEIN EXPRESSION AND PURIFICATION, ACADEMIC PRESS, US, vol. 12, 1998, pages 159-165, XP000984417</p> <p>ISSN: 1046-5928</p> <p>the whole document</p> <p>---</p> <p style="text-align: center;">-/--</p>	

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/05647

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PRYOR K D ET AL: "HIGH-LEVEL EXPRESSION OF SOLUBLE PROTEIN IN ESCHERICHIA COLI USING A HIS6-TAG AND MALTOSE-BINDIN-PROTEIN DOUBLE-AFFINITY FUSION SYSTEM" PROTEIN EXPRESSION AND PURIFICATION, ACADEMIC PRESS, US, vol. 10, no. 3, August 1997 (1997-08), pages 309-319, XP000891558 ISSN: 1046-5928 the whole document</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/05647

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 19 to 22 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/05647

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0062804	A	26-10-2000	AU 4246800 A	02-11-2000
			CA 2365523 A1	26-10-2000
			EP 1233780 A1	28-08-2002
			JP 2003506011 T	18-02-2003
			WO 0062804 A2	26-10-2000
			US 2003153020 A1	14-08-2003
			US 2003022178 A1	30-01-2003
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WO 03059945	A	24-07-2003	WO 03059945 A2	24-07-2003
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